

LISTING OF CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

1-13. (Canceled)

14. (Currently amended) A composite material fabricated by a process comprising:

a) forming a fibrous structure comprising carbon, polyacrylonitrile, or rayon fibers into a preform;

b) ~~initially predominantly coating the fibers of that fibrous structure preform with elemental carbon to impregnate~~that preform with elemental carbon to initially predominantly coat the fibers of the fibrous structure;

c) infiltrating the preform with a ceramic slurry to predominantly impregnate the fibers of the preform to form an impregnated green body;

d) infiltrating the impregnated green body with a liquid carbon precursor and pyrolyzing the liquid carbon precursor to form a carbon char;

e) infiltrating the impregnated green body with molten silicon to form a continuous matrix throughout the composite; and

f) reacting silicon in the continuous matrix with the carbon char to form silicon carbide, wherein said silicon carbide has a grain size of less than about 10 microns.

15. (Original) The composite of claim 14, wherein the ceramic slurry is a boron carbide slurry.

16. (Original) The composite of claim 14, wherein said fibers of said preform are made from polyacrylonitrile.
17. (Canceled)
18. (Original) The composite of claim 14, wherein said liquid carbon precursor is liquid naphthalene.
19. (Original) The composite of claim 14, wherein said molten silicon is a non alloyed silicon.
20. (Original) The composite of claim 14, wherein said molten silicon is an alloyed silicon.
21. (Original) The composite of claim 14, wherein said fibrous structure is initially coated with chemically vapor deposited elemental carbon.
22. (Original) The composite of claim 14, wherein said elemental carbon is deposited on the fibers using pitch or resin.
23. (Original) The composite of claim 14, wherein said infiltration with molten silicon occurs in the temperature range of about 1425 to about 1485° C.
24. (Original) The composite of claim 15, wherein said boron carbide slurry comprises boron carbide having a particle size of less than about 1 micron.
25. (Currently amended) A composite ceramic material comprising:
- a.) a fibrous structure comprising fibers of carbon, polyacrylonitrile, or rayon, and a silicon matrix; wherein said fibers are ~~initially predominantly coated with elemental carbon to impregnated said fibrous structure~~ with elemental carbon to initially predominantly coat the fibers of the fibrous structure, and wherein said fibrous structure is subsequently predominantly impregnated with boron carbide; and

b.) a silicon carbide phase which is continuous and predominantly encompasses said fibrous structure, wherein silicon carbide in said silicon carbide phase has a grain size of less than about 10 microns.

26-32. (Canceled)

33. (Original) A composite ceramic material according to claim 25, wherein the amount of unreacted silicon in the matrix is less than that required to form a liquid phase on the wear face of a disk made from the composite material during a severe energy event.

34. (Original) A composite ceramic material according to claim 25, wherein said composite material exhibits an absence of large SiC grains.

35. (Original) A composite ceramic material according to claim 34, wherein said large grains are larger than about 20 microns.

36. (Original) A composite ceramic material according to claim 25, wherein said material is less than 5 volume % residual silicon.

37. (Original) A composite ceramic material according to claim 25, wherein said boron carbide comprises about 5 to about 15 volume % of said material.

38. (Original) A composite ceramic material according to claim 25, wherein said fibrous structure impregnated with elemental carbon comprises from about 20 to about 45 volume % of said material.

39. (Original) A composite ceramic material according to claim 25, wherein said silicon carbide phase comprises from about 20 to about 40 volume % of said material.

40. (Original) A composite ceramic material according to claim 25, wherein said boron carbide has an average particle size of less than about 1 micron.

41. (Canceled)

42. (Original) A composite ceramic material according to claim 25, wherein said fibrous structure comprises from about 15 to about 40 volume % of said material.

43. (Previously presented) A composite ceramic material comprising:

a.) a fibrous structure and a silicon matrix which are initially predominantly impregnated with elemental carbon, and subsequently predominantly impregnated with boron carbide; and

b.) a silicon carbide phase which is continuous and predominantly encompasses said fibrous structure, wherein silicon carbide in said silicon carbide phase has a grain size of less than about 10 microns, whenever said fibrous structure comprises fibers of carbon, polyacrylonitrile, or rayon or combinations thereof, wherein said fibers are coated with elemental carbon.